

## BIOLOGICAL NOTES ON *OOSTERNUM ATTACOMIS* (COLEOPTERA: HYDROPHILIDAE), FROM MORELOS STATE, MEXICO<sup>1</sup>

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**ABSTRACT:** *Oosternum atacomis* was collected from two localities from Morelos State, Mexico, in refuse dumps of the leaf-cutting ants *Atta mexicana*. Higher abundance was detected at refuse dumps with lower temperature variation and high humidity. This is the first record of the species from Mexico.

The genus *Oosternum* includes nine species in the World. Two are distributed in the New World: *O. costatum* Sharp and *O. atacomis* Spangler (1962). The first one is widely distributed in America. The second one has been recorded only from Louisiana (U.S.A) and El Salvador, always associated with refuse dumps of the leaf-cutting ants *Atta*: *A. texana* (Buckley) and *A. mexicana* (F. Smith) (Smetana, 1978).

Ants of the genus *Atta* are widely distributed in the New World, from southern United States to South America (Pescador, 1980). Three species have been recorded from Mexico: *A. mexicana* has been recorded in 19 states; *A. texana* distributed in the northern part of the country and *A. cephalotes* (L) primarily in the tropical areas of southeastern Mexico (Smith, 1963). *A. mexicana* is distinguished from the other two Mexican species because the ant debris produced in the fungus gardens is carried out of the colony to form external refuse dumps; while *A. texana* and *A. cephalotes* store their debris in special underground chambers (Rojas, 1986, 1988; Deloya, 1988).

The goal of this paper is to provide biological notes on *O. atacomis*, a coleopterous insect inhabitant of refuse dumps of *A. mexicana* and to record it for the first time from Mexico.

### MATERIAL AND METHODS

Adults of *Oosternum atacomis* were collected in refuse dumps of the leaf cutting ant *A. mexicana*. Three refuse dumps in northern Morelos state were sampled at three month intervals between January 1992 and January 1993.

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Specimens were collected directly. Length, width and depth of the refuse dumps were measured in order to determine their volume. Temperature and humidity were also recorded.

One refuse dump designated as M-1 is near San Jose de los Laureles in a disturbed cloud forest. M-2 and M-3 are in Tlayacapan where temporary crops are found (Secretaría de Programación y Presupuesto, 1981) (Fig. 1).

## RESULTS AND DISCUSSION

*Oosternum attacomis* is recorded for the first time from Mexico.

Specimens examined are labelled: "MEXICO: Morelos, Tlayacapan, San José de los Laureles, 30-I-1992, *ex detritos de Atta mexicana*, J. Márquez col. (3 specimens)"; same data except for: "19-VII-1992, (22)"; same data except for: "24-x-1992, (153)"; same data except for: "8-IX-1990, J.L. Navarrete y G.A. Quiroz cols. (3)". "MEXICO: Morelos, Tlayacapan, 24-IV-1992, *ex detritos de Atta mexicana*, J. Márquez col. (1)"; same data except for: "20-VII-92, (2)"; same data except for: "25-X-1992, (2)". Additional specimen from Las Pilas, Morelos is labelled: MEXICO: Morelos, Las Pilas, 10-IV-1992, *ex detritos de Atta mexicana*, J.L. Navarrete y G.A. Quiroz cols.(1)".

The specimens are deposited in the following collections: Field Museum of Natural History, Chicago (FMNH); Canadian National Collection, Ottawa (CNC); Instituto de Biología, Universidad Nacional Autónoma de México, Cd. de México (IBUNAM); Museo de Historia Natural Cd. de México, Cd. de México (MHNCM); Centro de Zoología, Universidad de Guadalajara, Zapopan (CZUG); and in our entomological collections: Juan Márquez-Luna, Cd. de México (JML) and J.L. Navarrete, Zapopan (JLN).

M-1 and M-2 refuse dumps have similar debris volume, but M-1 has a lower temperature variation and high humidity. Temperatures of M-2 and M-3 are both higher than the environment, but the humidity of M-2 is intermediate between M-1 and M-3. M-3 is the smallest and driest refuse dump and presents the highest human perturbation.

Adults of *O. attacomis* seem to prefer the most humid and more stable temperature conditions of the M-1 refuse dump, since 178 specimens were collected there during the study. There is apparently less preference for the M-2 conditions, because only 5 specimens were collected there. Refuse dumps as disturbed and dry as M-3 seem not to offer appropriate conditions for this species. No specimens were collected there (Fig. 2).

Adults were most abundant during the rainy season (July and October samples) (Fig. 2).

Based on these observations and in the classifications provided by Rojas (1986) for the fauna associated with ant refuse dumps, we conclude that *O. attacomis* is a permanent inhabitant of ant refuse dumps. Permanent species are characterized because they spend all their life cycle in this microhabitat, which is richer in nutrients and facilitates the colonization of a higher diversity of insects.

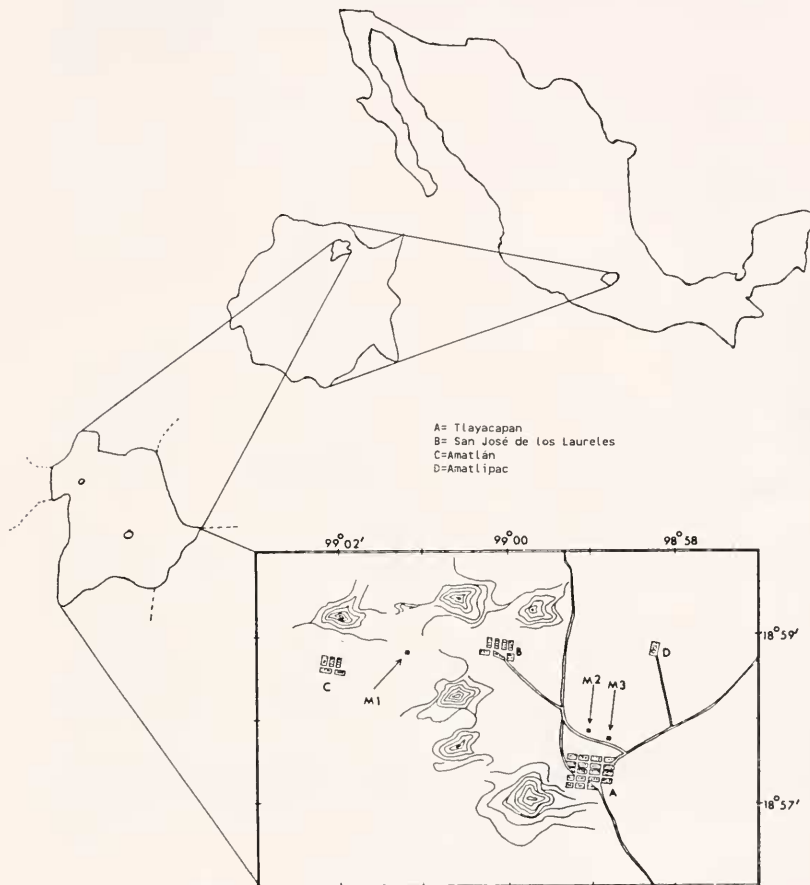


Figure 1. Location of study sites. (Map modified after Cartas Topográficas INEGI, 1991: Cuernavaca E-14-A-53 and Cuautla E14B51).

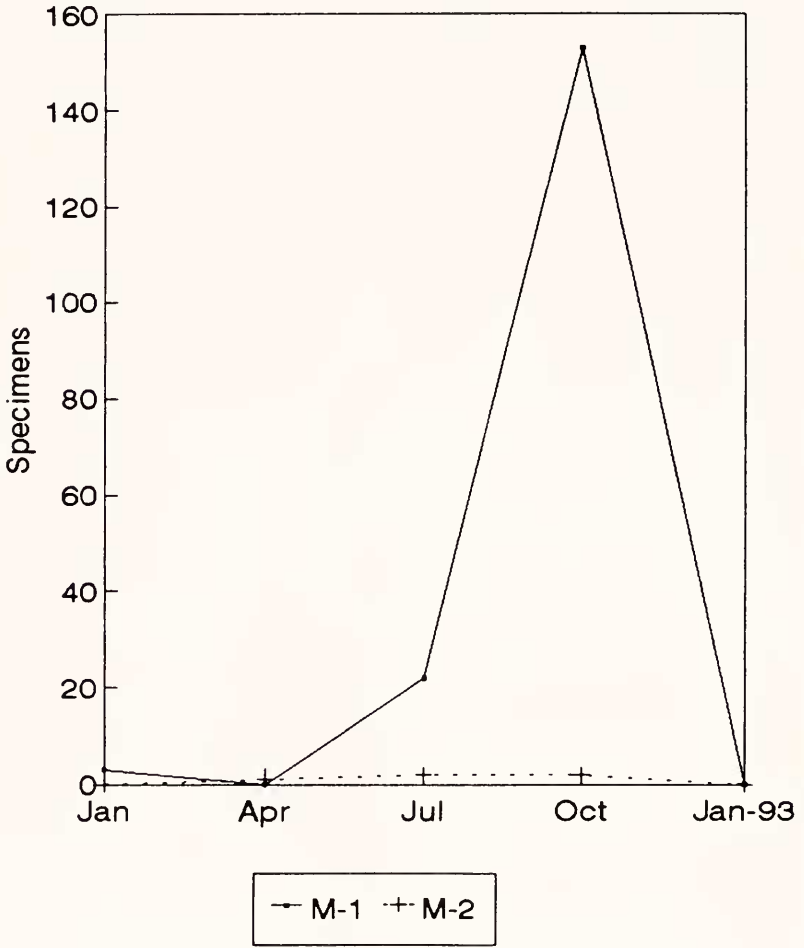


Figure 2. Abundance of *Oosternum atacomis* in two ant refuse dumps.

Márquez-Luna (1994) reported 22 permanent species of beetles that coexist with *O. attacomis* in this microhabitat. These are included in Table 1.

Table 1. Permanent species collected in three ant refuse dumps from northern Morelos, Mexico.\*

FAMILY	SPECIES	FAMILY	SPECIES
Alleculidae	<i>Hymenorus</i> sp.	Scydmaenidae	<i>Ascydmyus</i> sp. <i>Euconnus</i> sp. <i>Neladius</i> sp. 1 <i>Neladius</i> sp. 2
Cerylonidae	<i>Laphetus</i> sp.	Staphylinidae	<i>Falagonia mexicana</i> <i>Glenus</i> sp. aff. <i>flohri</i> <i>Glenus setosus</i> <i>Philonthus altius</i> <i>Platydracus fulvomaculatus</i>
Histeridae	<i>Epiglyptus costatus</i> <i>Hister</i> sp. <i>Phelister</i> sp. <i>Pseudister rufulus</i> <i>Xestipyge multistriatum</i>	Tenebrionidae	<i>Bycrea villosa</i>
Passalidae	<i>Ptichopus angulatus</i>	Undetermined	<i>Coleoptera</i> sp.
Scarabaeidae	<i>Ataenius holopubescens</i> <i>Aphodius dugesi</i> <i>Cloeotus nassutus</i> <i>Onthophagus rufescens</i>		

\**O. attacomis* is excluded. Relative abundance per refuse dump and for each sampling date are presented in Márquez-Luna (1994). Groups are in alphabetical order.

Faunal studies of ant debris have been carried out primarily in the external refuse dumps of *A. mexicana* possibly because they are easily detected. It is very possible that the distribution of this species in Mexico is similar to that of *A. mexicana* since other permanent inhabitants have such a pattern of distribution. However, this hydrophilid beetle seems to prefer refuse dumps with higher humidity and constant temperature in relation to the environment. This preference is reported for other permanent species of beetles (Márquez-Luna, 1994).

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#### LITERATURE CITED

- Deloya, A.C. 1988. Coleópteros lamellicornios asociados a depositos de detritos de *Atta mexicana* (Smith) (Hymenoptera: Formicidae) en el sur del Estado de Morelos, México. *Folia Entomol. Mex.*, 75: 77-91.
- Márquez-Luna, J. 1994. Coleopterofauna asociada a detritos de *Atta mexicana* (F. Smith) (Hymenoptera: Formicidae) en dos localidades del norte de Morelos, México. Tesis profesional, Fac. de Ciencias, UNAM. México, D.F. 134 pp.
- Pescador, A. 1980. Las hormigas arrieras. *Naturaleza*, 5: 278-290.
- Rojas, P. 1986. Attrópodos de las acumulaciones de detritos de *Atta mexicana* (F. Smith) en una zona árida del centro de México. Tesis profesional, Fac. de Ciencias, UNAM. México, D.F. 104 pp.

- Rojas, P. 1988. Nota sobre una población de *Bycrea villosa* Pascoe (Coleoptera: Tenebrionidae) en los detritos de *Atta mexicana* (F. Smith) (Hymenoptera: Formicidae). *Folia Entomol. Mex.*, 76: 37-43.
- Secretaría de Programación y Presupuesto. 1981. Síntesis geográfica de Morelos. México, D.F. 110 pp.
- Smetana, A. 1978. Revision of the subfamily Sphaeridiinae of America North of Mexico (Coleoptera: Hydrophilidae). *Memoirs, Entomol. Soc. Canada*, 105: 1-217.
- Smith, M. R. 1963. Notes on the leaf-cutting ants, *Atta* spp., of the United States and Mexico. *Proc. Entomol. Soc. Wash.*, 65(4): 299-302.
- Spangler, P.J. 1962. A new species of the genus *Oosternum* and a key to the U.S. species (Coleoptera: Hydrophilidae). *Proc. Biol. Soc. Wash.*, 75:97-100.

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## 1995 CALVERT AWARD

Since its inception in 1987, the annual presentation of the Calvert Award has become the centerpiece of the Society's April membership meeting. Coinciding with the explosion of springtime on the Delaware Valley, the event has a refreshing festive air in celebration of excellence by budding young entomologists. Attendance at this year's April meeting, as in the recent past, was the highest of the year. Members and guests arrived early to visit the exhibit, "Butterflies Live & in Color!," at the Academy of Natural Sciences and to look at the insect related science projects displayed by this year's Calvert Award winner and other recognized students.

Lisa Patrick, a ninth grade student at Central High School in Philadelphia, received the 1995 Calvert Award for her project on the "Effects of chlorine-treated wastewater on benthic invertebrates." Both the judges who evaluated the project at the Delaware Valley Science Fairs on April 5 and the Society membership at the April 26 membership meeting were tremendously impressed by Lisa and her project. It culminated four years of research on water quality and showed a sophisticated understanding of the interrelation of water chemistry, pollution control issues, and the biology of aquatic insects.

The first runnerup this year was Joshua Rufe, a seventh grade student at Penridge Central Junior High School in Perkasio, PA. Joshua's project on preying mantises revealed his unusual sensitivity for the care of these insects, excellent observational skills, and an intense curiosity about the insect's behavior.

In keeping with the practice of honoring projects dealing with local insects and natural settings, honorable mention went to Galeet Cohen who, having never knowingly seen a gypsy moth, did a science project on gypsy moths. She compared the growth of oak trees and tulip poplar trees, as revealed in their annual growth rings, to see the differential effects of gypsy moth defoliation in the early 1980's of oaks, but not tulip trees, in the same woodlots. Galeet is a tenth grade student at Central High School in Philadelphia.

Philip P. Calvert, for whom the Award is named, was himself a student at Central High School more than 100 years ago. [See ENT. NEWS 95(4): 155 - 162 (1984)]. Thus it seems fitting that this year and in past years that a disproportionately large number of insect-related projects recognized by the Society have come from this high school. All of those projects have been sponsored by a single teacher, Mr. Dennis Erlick. Recognizing the importance of teachers and mentors in cultivating the scientific interests of students, the Society presented a certificate to Mr. Erlick in special appreciation for his dedication to young people and his sponsorship of so many excellent projects.

Following the awards ceremony, the audience was treated to a beautifully illustrated talk on the Butterflies in Valley Forge National Park by Jane Ruffin, a member of the Society and a volunteer in the Entomology Department at the Academy of Natural Sciences.

Harold B. White  
Chair, AES Education Committee